

FP6 IST

SEEFIRE

South-East Europe Fibre Infrastructure for Research and Education



White Paper: Strategic Report on SE European Fibre Infrastructure for Research and Education

Executive Summary of SEEFIRE Deliverable 4.3 addressing infrastructure providers in Southeast Europe

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Abstract: This deliverable document is a brief executive summary of the SEEFIRE deliverable D4.3, the “White Paper: Strategic Report on SE European Fibre Infrastructure for Research and Education”. The SEEFIRE project was addressing the digital divide and inhibitors of research and education networking in SEE countries as well as the potential impact of NREN-initiated efforts for dark-fibre acquisition. This document targets infrastructure providers in southeast Europe. The reference deliverable, which is available at <http://www.seefire.org/publications>, was based on a preliminary version (v0) that was made available to the European Commission for comment and was distributed to participants at the SEEFIRE policy workshop held on 17 January 2006 in Bucharest, Romania.

The SEEFIRE Project

The SEEFIRE Project is was a special support action co-funded by the FP6 IST Programme of the European Commission, building on the success of previous activities and projects, including SEEREN, to support research and education networks in southeast Europe and will provide input for preparing the next-generation networks for research and education in the region. The project started on 1 March 2005 and ended on 28 February 2006.

The objectives of SEEFIRE were:

- establish a benchmark of existing and potentially available optical fibre for NRENs in the region;
- make an analysis of the technical options available for the deployment of dark fibre and the management of optical transmission by NRENs in the region;
- report on economic aspects and regulations;
- disseminate information and increase awareness about dark-fibre deployment both at technical and policy-making levels.

The recent progress in technology for optical transmission at high speed has made the deployment of owned or leased fibre networks a reality for NRENs. SEEFIRE studied the feasibility of cost-effective gigabit networks in southeast Europe, connecting researchers and universities in the region with other research users in Europe and worldwide. In doing so, the project aimed to contribute in reducing the digital divide that affects several countries in southeast Europe.

The SEEFIRE Consortium	
TERENA (co-ordinating contractor)	The Netherlands
GRNET	Greece
CESNET	Czech Republic
NIIF/HUNGARNET	Hungary
AMREJ	Serbia and Montenegro
DANTE	United Kingdom
RoEduNet	Romania
ISTF	Bulgaria
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ASA	Albania
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This document addresses providers of telecommunication infrastructure and owners of optical fibre in South East Europe in order to make them understand the role of National Research and Education Networks (NRENs) and seeing them as partners rather than as competitors. The key messages are:

- Infrastructure providers will benefit in the long term from a positive cooperation with NRENs, which can be seen as a source of human resources, trial ground for new technology, platform for knowledge transfer etc.;
- Developing research and education networks will promote the take up of internet services to other parts of the community driving revenues up;
- Partnership between the research and education community and the infrastructure providers can improve financial performance;
- Liberalisation of the market will encourage new changes and collaboration anyway, so collaboration is the sensible way of working in the future.

There is a significant digital divide in the provision of computer networking services to researchers, teachers and students in Europe. There are significant differences between various regions, regarding, for instance, the network coverage of more isolated regions and/or the amount of network capacity which is available to certain universities or research facilities. In many cases this is due to the lack of business interest/competition in the provision of telecommunication services to certain, more peripheral locations.

The GÉANT2 network, co-funded by the European Commission and the National Research and Education Networks of Europe through the GN2 project, constitutes a fair model to provide the highest possible amount of capacity to the countries involved in the project. However, due to variation of the market, certain locations can be reached by dark fibre, enabling initial access capacity of at least 10 Gbit/s and fast upgrades at marginal cost, whereas other locations cannot afford more than 155 Mbit/s or even 34 Mbit/s.

Although far behind the status of EU member states, the penetration of ICT in many countries in the SEE region is relatively high. PCs and mobile phones are widely available and there are a number of competing Internet Service Providers. However, the market for fixed telecommunication services (and infrastructure) is still de-facto in a monopoly or quasi-monopoly situation in many of the countries concerned, and this makes access to infrastructure for non-commercial purposes practically unaffordable.

The SERENATE study¹ has identified a clear correlation between the liberalisation of the market for data communication and the prices of telecom services. The stronger the competition is in a country, the lower the prices are for network connectivity. The lack of competition is therefore one of the major components of the digital divide between different regions in Europe.

The regulatory environment in which southeast European NRENs will be operating over the next few years is changing and this will have positive implications for NRENs, with particular reference to their use of dark fibre. All countries in the region are moving towards the new EU regulatory framework for electronic communications, although they are at different stages in this process. Liberalisation will bring NRENs more choice and lower prices. Their relationships with the incumbent telecommunications operator, ISPs, government and private-sector customers is inevitably going to change, as it happened in all EU countries and it is wise for the owners of infrastructure to timely consider partnership with NRENs as a strategic objective.

The current development among NRENs in the world is that they are heading towards optical networks. These are enabled by dark fibre, i.e., optical fibre dedicated to use by a single organisation – in this case a research network organisation – where the organisation is responsible for managing the transmission equipment to ‘light’ the fibre. NRENs are keen to access dark fibre to improve their networks, rather than lease data transmission services from telecom operators or commercial Internet Service Providers (ISPs).

In Europe an increasing number of NRENs, like SURFnet (Netherlands), SWITCH (Switzerland), DFN (Germany), CESNET (Czech Republic) and many more, have networks based on dark fibre. At the pan-European level, the new GÉANT2 backbone will have large parts of the international links based on dark fibre.

In southeast Europe, Greece, Serbia and the FYR of Macedonia are quite advanced in the deployment of dark fibre at metro and intercity level. The Serbian NREN, together with the Hungarian NREN, has established the

¹ The SERENATE project carried out studies into the evolution of European research and education networking. The project findings and recommendations are summarised in the report “Networks for Knowledge and Innovation”: <http://www.serenate.org/publications/d21-serenate.pdf>

first cross-border fibre connection in the region (between Subotica in Serbia and Szeged in Hungary). MARNet, the NREN of FYR of Macedonia has built a Metropolitan Area Network in the country capital Skopje connecting university buildings by optical fibre.

There are various possible types of dark-fibre acquisition by NRENs, including leasing fibre, with or without maintenance, buying Indefeasible Right of Use (IRU) or laying one's own fibre.

The management of optical transmission by NRENs is made possible by widely available and cost-effective technology. This has proved to be the case particularly in countries with a monopolistic market environment, where leasing the fibre and lighting it has been a winning alternative compared to leasing expensive circuits from an incumbent operator.

SEEFIRE has identified more than 70 potential owners of fibre in the southeast European region from such business sectors as telecommunications, railways, transport/roads, power distribution, gas/oil distribution, cable TV and Internet Service Providers. SEEFIRE has contacted them by issuing a Request for Information about the specifications of fibre routes and spans. This research clearly shows that optical fibre is accessible to NRENs in SEE. Almost in all countries there is fibre which is owned by some utility company, railways, etc. in addition to the optical infrastructure of telecommunication operators. Because the telecom operators are not keen to sell or lease fibre, NRENs will inevitably intensify their discussions with alternative suppliers and actively pursue the acquisition of fibre for their national network footprint.

Infrastructure providers should understand that NRENs are not-for-profit organizations playing an essential role in promoting ICT and building the Information Society in their countries. As a consequence they should be considered as precious collaborators rather than ordinary customers. As it has happened in many countries around the world, the benefits that operators would obtain by making a small portion of their fibre available to NRENs will be:

- Users of the infrastructure provided by NRENs, universities, research institutes and the education sector, will likely need to acquire connectivity from operators for the last mile in order to connect to the NREN backbone. This would help creating a new market for the operators themselves;
- Such users will need to subscribe to a strict Acceptable Use Policy not allowing the usage of the Internet for commercial purposes, nor the possibility to resell services to third parties;
- The university computer centres will need to increase their personnel resources to manage and operate their networks and this will contribute to creating a pool of qualified technicians that will later access the professional market with skills in network operation and this will increase the demand for high capacity networks and services among business and domestic consumers;
- The academic network can be used as a testbed for experimenting new network technologies that could be strategic for operators to test and later implement in commercial services;
- By collaborating with research and education networks operators will be able to show their customers the capability of such new technologies and services;
- Operators can get a positive reputation as advanced enterprises with a social attitude as part of their mission.

